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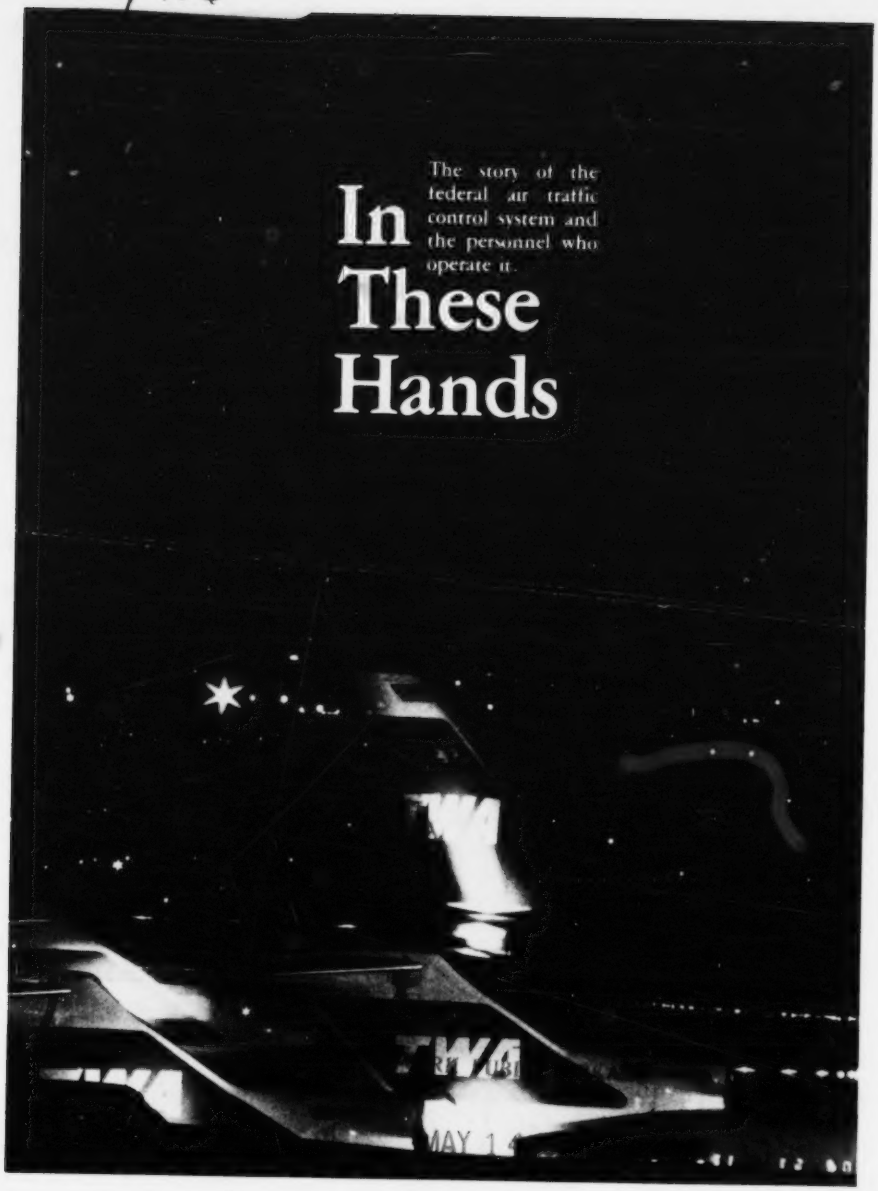

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The Story of Air Traffic Control

"Flight 123 now arriving at Gate 4" is a typical announcement that comes booming over airport loudspeaker systems thousands of times each day all over the country. Behind this matter-of-fact announcement lies a nationwide system that has provided air traffic control service in the airspace through which the aircraft traveled, from departure gate to arrival. The safety of commercial air travelers is in the hands of a largely unseen group of air traffic control specialists of the department of Transportation's Federal Aviation Administration.

About half of FAA's more than 45,000 employees work in air traffic control. There are over 15,000 specialists directly involved in the control and separation of aircraft. Nearly 9,700 specialists in electronics maintain the complex communication, navigation and radar systems.

Depending on weather conditions, all aircraft fly by one of two sets of FAA rules—either instrument flight rules (IFR) or visual flight rules (VFR). when it is bad, flights normally are conducted under IFR procedures. Under VFR, the pilot flies by visual reference to the ground and he is solely responsible for avoiding other aircraft, although he may request radar assistance in locating other traffic.

When the cloud ceiling or the horizontal visibility is below VFR minimums, flight is permissible only by aircraft and pilots qualified to fly by instrument flight rules. The safe separation of these flights is the primary task of Air Traffic Service.

Even in good weather, major air carriers and many corporate aircraft in frequent use elect to fly IFR in order to take full advantage of the inflight separation from othe IFR aircraft provided by designated air routes and monitored by radar. Flying IFR, a pilot comes into contact with all sections of air route traffic control.

Airport Traffic Control Towers

As many as a hundred aircraft per hour take off or land at busy airports every day. Responsibility for the safe, orderly flow of these takeoffs and landing belongs to the air traffic controllers in FAA's more than 400 airport control towers, located at the nation's busiest airports.

Except for certain "high density" airports where a reservation system is used (such as John F. Kennedy, Newark and La Guardia Airports in New York, Washington National Airport, and Chicago O'Hare) arrival or departure at a tower-controlled airport is on a first-come, first-served basis, regardless of the size of the aircraft or the number of persons on board.

At all airports provided with an FAA tower, use of the runways is directed by a *local* controller in the glass-walled tower cab, usually adjoining the main terminal building. Aircraft are allowed to take off or land in much the same manner as surface traffic is moved through a busy intersection by a policeman—but in place of hand signals, radio communication is used to sequence aircraft movements. The controller also provides the pilot with certain essential flight information—principally the runway in active use, wind direction and velocity, and altimeter setting (barometric pressure).

On the ground, aircraft are directed to and from parking areas by radio contract with a *ground* controller.

Flight service station specialists provide pre- and in-flight briefings to pilots, record their flight plans and advise them about weather along their flight paths, as well as initiate search and rescue.

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Airline passengers who travel in comfort and security are seldom aware of the vast network of ground-based FAA facilities that protect and guide their aircraft in flight across the country.

Staffing and equipping of towers depends mainly on the volume of air traffic being served. The busiest airports have radar equipped towers with a staff of 175. Nonradar towers average 6 controllers. Controllers are qualified to work any of the control positions and they rotate through the positions to maintain proficiency.

Equipment found in towers includes ground-to-air radio transmitters and receivers for direct communications with the pilot; radar, used to locate, identify, and direct aircraft as far as 60 miles away; and a land communications system made up of extensive radio, teletype, and telephone equipment.

Air Route Traffic Control Centers

The tower controller will transfer control of departing IFR aircraft (including all commercial flights) to the nearest air route radar traffic control center. Under radar surveillance and in frequent radio contact, IFR aircraft are assigned a particular flight level and air route, are passed along from one center to the adjoining one (20 centers are located about 200 miles apart throughout the contiguous United States) and are finally released to the tower controller at the arrival airport.

The center controller depends entirely on radar to "see" his traffic. He works behind his windowless walls, in a low, dimly lit building where banks of radar scopes reveal the progress of all aircraft within a 200-mile radius. As many as 50 controllers (more in the large centers) may work on one shift. One controller will watch as many as 20 blips of light on the scope, identified through voice contact or automatically when the aircraft is equipped with a radar-responding device called a *transponder*. The alphanumeric data tag includes an altitude reading and speed.

Flight Service Stations

All aircraft may make use of FAA flight service stations, although these facilities primarily service general aviation pilots—who number over 700,000. Located at airports, the flight service station is essentially a communications center with a radio range extending from 100 to 200 miles. FAA has more than 300 flight service stations, distributed over the nation, each manned 24 hours a day.

Airway Facilities technicians do vital maintenance on air traffic and airport equipment.

Air traffic controllers in 22 large air route traffic control centers across the country and in Hawaii and Alaska monitor the progress of enroute aircraft on their radar scopes, keep them properly separated and flowing smoothly.

with a staff of from five to more than 80 personnel.

Specialists at the station, with expert aviation knowledge of the area within 400 miles of their station, provide preflight and inflight briefings which include pertinent information about weather, airports, altitudes, routes and other flight-planning data.

The large general aviation fleet—business, private, recreational—consists of more than 200,000 aircraft, as compared with about 4,000 for the airlines. General aviation pilots now fly more than 35 million hours a year.

All IFR aircraft file a flight plan (optional for VFR) with the nearest FSS which relays the data to all en route facilities and the FSS at the destination airport. In this manner, the progress of en route aircraft is anticipated, and the failure of a pilot to maintain his schedule or to close out his flight plan on arrival automatically triggers a search and rescue effort. These efforts are initiated by the flight service station at the missing aircraft's destination.

The outstanding record of all three elements of the Air Traffic Service—towers, centers, and flight service stations, with their 34,000 dedicated air traffic and electronics maintenance specialists—has made air travel safe and dependable. The fact that today few people hesitate to travel by air is a token of the trust we all have in those invisible hands which guide us safely through the sky, through the dark and night, and the uncertainty of changing weather.

Candidates for air traffic control work are recruited locally at FAA field offices and trained at the Aeronautical Center in Oklahoma City. It is a career with a challenging future.

A familiar sight at airports is the glass-windowed air traffic control tower, which often includes a radar room in addition to the cab, where controllers oversee the safe and orderly flow of takeoffs and landings by all aircraft. This service is provided more than a million and a half times a day at more than 400 airports.

U.S. Department
of Transportation
**Federal Aviation
Administration**

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